



DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2022-0588; Project Identifier AD-2022-00114-T]

RIN 2120-AA64

Airworthiness Directives; The Boeing Company Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: The FAA proposes to supersede Airworthiness Directive

(AD) 2021-14-20, which applies to all The Boeing Company Model 737 airplanes.

AD 2021-14-20 requires repetitive functional tests of the cabin altitude pressure switches, and on-condition actions, including replacement, if necessary. AD 2021-14-20 also requires reporting test results. Since the FAA issued AD 2021-14-20, data collected from the reports required by AD 2021-14-20 revealed that the switches were subject to false test failures due to lack of clear instructions for setup of the test adapters during the functional tests. This proposed AD would retain the repetitive functional tests and on-condition actions, and specify certain adapter requirements for the functional tests. The FAA is proposing this AD to address the unsafe condition on these products.

DATES: The FAA must receive comments on this proposed AD by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

- Federal eRulemaking Portal: Go to <https://www.regulations.gov>. Follow the instructions for submitting comments.
- Fax: 202-493-2251.

- Mail: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, Washington, DC 20590.

- Hand Delivery: Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

Examining the AD Docket

You may examine the AD docket at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2022-0588; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this NPRM, any comments received, and other information. The street address for Docket Operations is listed above.

FOR FURTHER INFORMATION CONTACT: Nicole Tsang, Aerospace Engineer, Cabin Safety and Environmental Systems Section, FAA, Seattle ACO Branch, 2200 South 216th St., Des Moines, WA 98198; phone and fax: 206-231-3959; email: Nicole.S.Tsang@faa.gov.

SUPPLEMENTARY INFORMATION:

Comments Invited

The FAA invites you to send any written relevant data, views, or arguments about this proposal. Send your comments to an address listed under ADDRESSES. Include “Docket No. FAA-2022-0588; Project Identifier AD-2022-00114-T” at the beginning of your comments. The most helpful comments reference a specific portion of the proposal, explain the reason for any recommended change, and include supporting data. The FAA will consider all comments received by the closing date and may amend the proposal because of those comments.

Except for Confidential Business Information (CBI) as described in the following paragraph, and other information as described in 14 CFR 11.35, the FAA will post all

comments received, without change, to <https://www.regulations.gov>, including any personal information you provide. The agency will also post a report summarizing each substantive verbal contact received about this proposed AD.

Confidential Business Information

CBI is commercial or financial information that is both customarily and actually treated as private by its owner. Under the Freedom of Information Act (FOIA) (5 U.S.C. 552), CBI is exempt from public disclosure. If your comments responsive to this NPRM contain commercial or financial information that is customarily treated as private, that you actually treat as private, and that is relevant or responsive to this NPRM, it is important that you clearly designate the submitted comments as CBI. Please mark each page of your submission containing CBI as “PROPIN.” The FAA will treat such marked submissions as confidential under the FOIA, and they will not be placed in the public docket of this NPRM. Submissions containing CBI should be sent to Nicole Tsang, Aerospace Engineer, Cabin Safety and Environmental Systems Section, FAA, Seattle ACO Branch, 2200 South 216th St., Des Moines, WA 98198; phone and fax: 206-231-3959; email: Nicole.S.Tsang@faa.gov. Any commentary that the FAA receives which is not specifically designated as CBI will be placed in the public docket for this rulemaking.

Background

The FAA issued AD 2021-14-20, Amendment 39-21647 (86 FR 38214, July 20, 2021) (AD 2021-14-20), for all The Boeing Company Model 737 airplanes.

AD 2021-14-20 was prompted by reports of latent failures of the cabin altitude pressure switches. AD 2021-14-20 requires repetitive functional tests of the pressure switches, and on-condition actions, including replacement, if necessary. The agency issued AD 2021-14-20 to address the unexpectedly high rate of latent failure of both pressure switches on the same airplane, which could result in the cabin altitude warning system

not activating if the cabin altitude exceeds 10,000 feet, resulting in hypoxia of the flightcrew and loss of control of the airplane.

Actions Since AD 2021-14-20 Was Issued

Since the FAA issued AD 2021-14-20, Boeing, Eaton Aerospace (the cabin altitude warning switch supplier) and the FAA analyzed data collected from the reports required by AD 2021-14-20. That data revealed that the switches were subject to false test failures due to lack of clear instructions for setup of the test adapters during the functional tests. For most of the switches that were tested by the supplier after failing a functional test, no fault was found in the switches. Instead, it was determined that if a test adapter not meeting certain criteria (threads having a full thread depth of no greater than 0.438 inches (1.113 cm) and an overall length less than 0.500 inches (1.270 cm)) is connected to the cabin altitude warning switch, false failures may occur during the functional test. Based on this analysis, Boeing revised its airplane maintenance manual (AMM) procedures, which provide guidance for performing the functional test, to specify criteria for the adapters and matching hoses (those that are 25 feet to 40 feet (7.62 to 12.19 meters) long, with #4 AN fitting to the adapter and quick disconnect (if applicable) to the air data test set). The matching hose criteria ensures there is a connection between the pressure switch and the air data test set. The FAA determined that AD 2021-14-20 should be superseded to ensure the functional tests are performed using the correct adapters to avoid false failure results. In addition, the FAA determined that sufficient data has been received regarding the cause of the failures of the cabin altitude pressure switches. Therefore, the reporting required by AD 2021-14-20 is no longer needed. This proposed AD would therefore retain the repetitive functional tests and on-condition actions, and specify certain adapter requirements for the functional tests.

FAA's Determination

The FAA is issuing this NPRM after determining that the unsafe condition described previously is likely to exist or develop on other products of the same type design.

Proposed AD Requirements in this NPRM

This proposed AD would retain certain requirements of AD 2021-14-20. This proposed AD would continue to require repetitive functional tests of the pressure switches having part number 214C50-2, and on-condition actions, including replacement, if necessary. This proposed AD would require using adapters and matching hoses meeting certain criteria when performing the functional tests, as specified in figure 1 to paragraph (g) of this AD. This proposed AD would also eliminate the reporting required by AD 2021-14-20.

Effect of Certain Installation Procedures on Accomplishment of AD Requirements

The FAA issued AD 2015-21-11, Amendment 39-18304 (80 FR 65927, October 28, 2015) (AD 2015-21-11) applicable to certain Model 737-100, -200, -200C, -300, -400, -500, -600, -700, -700C, -800, -900, and -900ER series airplanes. AD 2015-21-11 requires, among other actions, the installation of a redundant cabin altitude pressure switch in accordance with specified Boeing service information. The FAA has since approved numerous supplemental type certificates (STCs) and other means for installing the redundant pressure switch. As a result of its oversight of these newly-installed switches, the FAA has determined that use of approved maintenance procedures for the cabin altitude pressure switch functional test other than the task cards specified in Note 1 to paragraph (g) of this AD, is acceptable for the functional test, provided the adapter meets the criteria specified in paragraph (g) of this AD. Therefore, those other procedures do not require approval of an alternative method of compliance (AMOC).

Costs of Compliance

The FAA estimates that this AD, if adopted as proposed, would affect 2,693 airplanes of U.S. registry. The FAA estimates the following costs to comply with this proposed AD:

Estimated costs

Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
Functional test	1 work-hour X \$85 per hour = \$85 per test	\$*	\$85 per test	\$228,905 per test

* If the operator needs to buy an adapter, the FAA estimates the adapter could cost up to \$3,644. The FAA has no way of determining the number of operators that might need to purchase an adapter.

The FAA estimates the following costs to do any necessary on-condition actions that would be required based on the results of the functional test. The FAA has no way of determining the number of aircraft that might need these actions:

On-condition costs

Action	Labor cost	Parts cost	Cost per product
Switch replacement	1 work-hour X \$85 per hour = \$85	\$1,278	\$1,363

Authority for this Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, Section 106, describes the authority of the FAA Administrator. Subtitle VII, Aviation Programs, describes in more detail the scope of the Agency's authority.

The FAA is issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701, General requirements. Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority

because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

The FAA has determined that this proposed AD would not have federalism implications under Executive Order 13132. This proposed AD would not have a substantial direct effect on the States, on the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that the proposed regulation:

- (1) Is not a “significant regulatory action” under Executive Order 12866,
- (2) Would not affect intrastate aviation in Alaska, and
- (3) Would not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

The Proposed Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA proposes to amend 14 CFR part 39 as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. The FAA amends § 39.13 by:

- a. Removing Airworthiness Directive (AD) AD 2021-14-20, Amendment 39-21647 (86 FR 38214, July 20, 2021), and

- b. Adding the following new AD:

The Boeing Company: Docket No. FAA-2022-0588; Project Identifier

AD-2022-00114-T.

(a) Comments Due Date

The FAA must receive comments on this airworthiness directive (AD) action by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

This AD replaces AD 2021-14-20, Amendment 39-21647 (86 FR 38214, July 20, 2021) (AD 2021-14-20).

(c) Applicability

This AD applies to all The Boeing Company Model 737-100, -200, -200C, -300, -400, -500, -600, -700, -700C, -800, -900, and -900ER series airplanes and Model 737-8, 737-9, and 737-8200 airplanes, certificated in any category.

(d) Subject

Air Transport Association (ATA) of America Code 21, Air conditioning.

(e) Unsafe Condition

This AD was prompted by reports of latent failures of the cabin altitude pressure switches, and the determination that using certain adapters while performing a functional test may lead to false failures of the cabin altitude pressure switches. The FAA is issuing this AD to address the unexpectedly high rate of latent failure of both pressure switches on the same airplane which could result in the cabin altitude warning system not activating if the cabin altitude exceeds 10,000 feet, resulting in hypoxia of the flightcrew, and loss of control of the airplane.

(f) Compliance

Comply with this AD within the compliance times specified, unless already done.

(g) Repetitive Functional Tests

(1) At the latest of the times specified in paragraphs (g)(1)(i) through (iii) of this AD, perform a functional test of the cabin altitude pressure switches having part number 214C50-2, using an adapter as specified in figure 1 to paragraph (g) of this AD, or an equivalent adapter, and matching hose to connect to the cabin altitude warning switch. Repeat the functional test thereafter at intervals not to exceed 2,000 flight hours. If, during any functional test, any cabin altitude pressure switch fails to activate at an altitude of between 9,000 and 11,000 feet, replace the switch before further flight.

(i) Within 2,000 flight hours since the last functional test of the cabin altitude pressure switches.

(ii) Prior to the accumulation of 2,000 total flight hours on the airplane.

(iii) Within 90 days after the effective date of this AD.

(2) Adapters are considered to be equivalent as long as the mating side with the switch meets the specifications in either paragraph (g)(2)(i) or (ii) of this AD:

(i) Greater than or equal to 0.265 inches (0.673 cm) X 7/16-20-UNJF-3A and less than or equal to 0.438 inches (1.113 cm) X 7/16-20-UNJF-3A for the flareless end; or

(ii) Less than or equal to 0.5 inches (1.27 cm) total with greater than or equal to 0.265 inches (0.673 cm) X 7/16-20-UNJF-3A thread for AN4 flared end.

Figure 1 to paragraph (g) of this AD –*Functional Test Adapters*

Use one of the following adapters, or an equivalent adapter, and matching hose to connect to the cabin altitude warning switch:

(1) SAE J514 part number (P/N) 070220 90 Degree Straight Thread Elbow and appropriate sized O-ring (Preferred).

- Use a Barfield Pitot Hose, or equivalent 25 feet (7.62 m) to 40 feet (12.19 m) long hose, with #4 AN fitting to the adapter and quick disconnect (if applicable) to the air data test set.
- Make sure that the flat side of the adapter is connected with the cabin altitude warning switch.

NOTE: Do not connect the flared side of the adapter with the cabin altitude warning switch. Connecting the flared side of the adapter with the cabin altitude warning switch may bottom out the cabin altitude warning switch, resulting in false test results.

(2) SAE J514 P/N 070320 45 Degree Straight Thread Elbow and appropriate sized O-ring (Preferred).

- Use a Barfield Pitot Hose, or equivalent 25 feet (7.62 m) to 40 feet (12.19 m) long hose, with #4 AN fitting to the adapter and quick disconnect (if applicable) to the air data test set.
- Make sure that the flat side of the adapter is connected with the cabin altitude warning switch.

NOTE: Do not connect the flared side of the adapter with the cabin altitude warning switch. Connecting the flared side of the adapter with the cabin altitude warning switch may bottom out the cabin altitude warning switch, resulting in false test results.

(3) SAE J514 P/N 070120 Straight Thread Connector Short and appropriate sized O-ring (Preferred).

- Use a Barfield Pitot Hose, or equivalent 25 feet (7.62 m) to 40 feet (12.19 m) long hose, with #4 AN fitting to the adapter and quick disconnect (if applicable) to the air data test set.
- Make sure that the flat side of the adapter is connected with the cabin altitude warning switch.

NOTE: Do not connect the flared side of the adapter with the cabin altitude warning switch. Connecting the flared side of the adapter with the cabin altitude warning switch may bottom out the cabin altitude warning switch, resulting in false test results.

(4) AS21900-4 (or MS21900-4) Flareless Tube to Flared Tube Adapter and appropriate sized O-ring (Preferred).

- Use a Barfield Pitot Hose, or equivalent 25 feet (7.62 m) to 40 feet (12.19 m) long hose, with #4 AN fitting to the adapter and quick disconnect (if applicable) to the air data test set.
- Make sure that the flat side of the adapter is connected with the cabin altitude warning switch.

NOTE: Do not connect the flared side of the adapter with the cabin altitude warning switch. Connecting the flared side of the adapter with the cabin altitude warning switch may bottom out the cabin altitude warning switch, resulting in false test results.

(5) P/N JUD321 Hose Fitting with MS28778-4 O-ring (Eaton Aerospace LLC, Bethel, CT 02750) (Preferred).

- Use a Barfield Pitot Hose, or equivalent 25 feet (7.62 m) to 40 feet (12.19 m) long hose, with #4 AN fitting to the adapter and quick disconnect (if applicable) to the air data test set.

(6) AN807-4D (or AS5180D04 or AS5180W04) Tube to Hose Adapter, AN924-4 nut and appropriate sized O-ring (on the mating side with the switch) and spacer or washers (Alternate).

NOTE: This adapter can be used if the steps below are carefully followed. This adapter is not preferred because if the AN924-4 nut is not connected carefully as recommended below, this may bottom out the cabin altitude warning switch, resulting in false test results.

- Use a Barfield Pitot Hose, or equivalent 25 feet (7.62 m) to 40 feet (12.19 m) long hose, with quick disconnect (if applicable) to the air data test set.
- Make sure that the thread length, including fitting end after the installation of AN924-4 nut and appropriate sized 7/16 spacer or washers, is less than 0.5 inch (1.270 cm) to avoid false test results.

Note 1 to paragraph (g): Additional guidance for performing the functional test required by paragraph (g) of this AD can be found in 737-200 Airplane Maintenance Manual (AMM) 21-33-11/501, 737CL AMM TASK CARD 31-026-01-01, 737CL AMM TASK CARD 31-010-01-01, 737NG AMM TASK CARD 31-020-00-01, and 737MAX AMM TASK CARD 31-020-00-01, and other approved maintenance procedures.

(h) Minimum Equipment List Provisions

If any cabin altitude warning switch fails any functional test as required by this AD, the airplane may be operated as specified in the operator's existing FAA-approved MEL, provided provisions that specify operating the airplane at a flight altitude at or below 10,000 feet mean sea level (MSL) with the cabin altitude warning system inoperative are included in the operator's existing FAA-approved MEL.

(i) Alternative Methods of Compliance (AMOCs)

(1) The Manager, Seattle ACO Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In

accordance with 14 CFR 39.19, send your request to your principal inspector or responsible Flight Standards Office, as appropriate. If sending information directly to the manager of the certification office, send it to the attention of the person identified in paragraph (j)(1) of this AD. Information may be emailed to 9-ANM-Seattle-ACO-AMOC-Requests@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the responsible Flight Standards Office.

(3) An AMOC that provides an acceptable level of safety may be used for any repair, modification, or alteration required by this AD if it is approved by The Boeing Company Organization Designation Authorization (ODA) that has been authorized by the Manager, Seattle ACO Branch, FAA, to make those findings. To be approved, the repair method, modification deviation, or alteration deviation must meet the certification basis of the airplane, and the approval must specifically refer to this AD.

(j) Related Information

(1) For more information about this AD, contact Nicole Tsang, Aerospace Engineer, Cabin Safety and Environmental Systems Section, FAA, Seattle ACO Branch, 2200 South 216th St., Des Moines, WA 98198; phone and fax: 206-231-3959; email: Nicole.S.Tsang@faa.gov.

(2) For service information identified in this AD that is not incorporated by reference, contact Boeing Commercial Airplanes, Attention: Contractual & Data Services (C&DS), 2600 Westminister Blvd., MC 110-SK57, Seal Beach, CA 90740-5600; telephone 562-797-1717; Internet <https://www.myboeingfleet.com>.

Issued on May 16, 2022.

Gaetano A. Sciortino, Deputy Director for Strategic Initiatives,
Compliance & Airworthiness Division,
Aircraft Certification Service.

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